UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,721	11/13/2001	J. Andrea McCart	NIH174.001C1	5587

5318 7590 05/20/2003

NATIONAL INSTITUTES OF HEALTH
OFFICE OF TECHNOLOGY TRANSFER
6011 EXECUTIVE BLVD SUITE 325
ROCKVILLE, MD 20852-3804

EXAMINER
SULLIVAN, DANIEL M

ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 05/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/991,721	MCCART ET AL.	
	Examiner	Art Unit	
	Daniel M Sullivan	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 March 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *19-24 and 26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is the First Office Action on the Merits of the application filed 13 November 2001 as a continuation of international application PCT/US00/14679 filed 26 May 2000, which claims benefit of U.S. provisional application 60/137,126 filed 28 May 1999. The Preliminary Amendment filed 23 January 2002 has been entered. Claims 1-26 are pending in the application.

Election/Restrictions

Applicant's election of Group I, claims 1-18 and 25 in Paper No. 15, filed 18 March 2003, is acknowledged. Because applicant did not distinctly and specifically point out errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 19-24 and 26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention.

Claim Objections

Claim 16 is objected to because of the following informalities: According to proper English grammar, the intransitive verb "is" should be appear between "composition" and "present". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 17 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are directed to compositions comprising a specifically named strain of vaccinia virus created by Applicant. Because the complexity of biological systems precludes independent derivation of a vaccinia virus strain having characteristics identical to the claimed VVDD or VVDDEGF viruses, the skilled artisan would not be able to make the claimed invention. Therefore the claims are not enabled by the teachings of the specification and prior art. This rejection can be traversed by perfecting a deposit of the VVDD and VVDDEGF strains according to the rules for deposit of biological material (M.P.E.P. 2401-2411).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 6-12, 14, 15 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bodemer *et al.* (1991) EP 0 443 335 (made of record in the IDS filed 16 July 2002 (Paper No. 10)) as evidenced by Kaplan, C. (1989) *Arch. Virol.* 106:127-139 and Buller *et al.* (1988) *J. Virol.* 62:866-874 (made of record in Paper No. 10).

Bodemer *et al.* teaches a composition of matter comprising a vaccinia virus vector wherein said vector is constructed such that the thymidine kinase (TK) and virus growth factor (VGF) genes are inactivated (see especially page 4, line 50 through page 5, line 8 and page 6, lines 29-47). Thus, Bodemer *et al.* teaches all of the limitations of the independent claim 1. Bodemer *et al.* further teaches the composition: wherein said composition further comprises an exogenous nucleotide sequence according to claim 2 (see especially page 6, lines 51-54); wherein inactivation of the TK gene comprises inserting or substituting a nucleic acid sequence according to claims 5 and 6 (see especially page 4, lines 51-57); wherein inactivation of the VGF gene comprising deletion of the DNA sequence encoding the EGF receptor-binding site and insertion of the LacZ gene according to claims 7-11 (see especially page 6, lines 31-34 and the Kaplan reference cited therein; Kaplan, paragraph bridging pages 132 and 133 and the Buller *et al.* reference cited therein; and Buller *et al.*, Figure 1 and the caption thereto); wherein the vector comprises an exogenous nucleotide sequence that is a cytokine or antigen encoding gene according to claim 12, or is Factor VIII according to claim 14 (see especially the second and third paragraphs on page 7); and wherein the expression vector is produced by a virus particle containing a virus genome wherein expression of said genome produces a vaccinia virus having a negative TK phenotype and a negative VGF phenotype according to claim 15.

Claim 25 is a product-by-process claim and as such reads on a composition comprising a recombinant vaccinia virus vector having a negative TK phenotype and a negative VGF phenotype made by any means. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) states: "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a

product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." Thus, the recombinant vaccinia virus vector taught by Bodemer *et al.* anticipates claim 25.

As Bodemer *et al.* teaches a composition comprising each of the limitations of the instant claims 1, 2, 5, 6-12, 14, 15 and 25, the claims are anticipated by Bodemer *et al.*

Claims 1-9, 12, 15 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Paoletti *et al.* (1992) WO 92/15672 (made of record in Paper No. 10).

Paoletti *et al.* teaches a composition of matter comprising a vaccinia virus vector wherein said vector is constructed such that the TK and virus VGF genes are inactivated (i.e., the NYVAC.2 vector in which the VGF gene is deleted from the TK negative NYVAC vector; see especially the paragraph bridging pages 127 and 128 and the second full paragraph on page 14). Thus, Paoletti *et al.* teaches all of the limitations of the independent claim 1. Paoletti *et al.* further teaches the composition: wherein said composition further comprises an exogenous nucleotide sequence according to claim 2 (see especially Examples 18-22, 25, 30, 32, 41, 45 and 46); wherein inactivation of the TK gene comprises deletion of the TK gene according to claims 3 and 4, and wherein a nucleic acid sequence can be inserted or substituted at the TK gene locus according to claims 5 and 6 (see especially the first and second full paragraphs on page 14); wherein inactivation of the VGF gene comprises deletion of the VGF gene, including the DNA sequence encoding the EGF receptor-binding site, according to claims 7-9 (see especially the paragraph bridging pages 127 and 128); wherein the vector comprises an exogenous nucleotide

sequence that is an antigen encoding gene according to claim 12 (see especially Examples 18-22, 25, 30, 32, 41, 45 and 46); and wherein the expression vector is produced by a virus particle containing a virus genome wherein expression of said genome produces a vaccinia virus having a negative TK phenotype and a negative VGF phenotype according to claim 15. Finally, for the reasons set forth above regarding anticipation of a claimed product by process, the recombinant vaccinia virus vector taught by Paoletti *et al.* anticipates claim 25.

As Paoletti *et al.* teaches a composition comprising each of the limitations of the instant claims 1, 2, 5, 6-12, 14, 15 and 25, the claims are anticipated by Paoletti *et al.*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 5, 6-12, 13, 14, 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodemer *et al.* (*supra*) as evidenced by Kaplan, C. (*supra*) and Buller *et al.* (*supra*) and further in view of any one of Lee *et al.* (U.S. Patent No. 5,851,991), Kamb (U.S. Patent No. 5,739,027), Herlyn *et al.* (U.S. Patent No. 5,622,835), Rotter *et al.* (WO 94/10575) or Spitsberg *et al.* (WO 98/08394).

The teachings of Bodemer *et al.*, Kaplan and Buller *et al.* are applied to claims 1, 2, 5, 6-12, 14, 15 and 25 as set forth above. Bodemer *et al.* teaches that the composition disclosed therein has utility for the expression of recombinant proteins (see especially the second paragraph on page 2), which can be used to vaccinate animals (see especially paragraphs 4-6 on page 7). Bodemer *et al.* does not teach the composition comprising an exogenous nucleotide sequence selected from the group consisting of the WT1 gene, the p53 gene, the p16 gene, the Rb gene and the BRCA1 gene according to claims 12 and 13.

Lee *et al.* teaches a method of raising an antibody against pRB and utility of the antibody (see especially column 20-21); Kamb teaches a method of raising an antibody against p16 (MTS1) and utility of the antibody (see especially columns 55-56, Examples 16-18); Herlyn *et al.* teaches a method of raising an antibody against WT1 and utility of the antibody (see especially columns 4-9); Rotter *et al.* teaches the use of purified p53 protein to assay for the

presence of anti-p53 antibodies in serum (see especially pages 5-6); and Spitsberg *et al.* teaches a method of producing an antibody against BRCA1 and utility for the antibody (see especially the Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bodemer *et al.*, Kaplan and Buller *et al.* with the teachings of any one of Lee *et al.*, Kamb, Herlyn *et al.*, Rotter *et al.* or Spitsberg *et al.* to produce the composition of the instant claims 12 and 13. Motivation to combine these teachings comes from the teachings of Bodemer *et al.* who teaches that the pox-virus system disclosed therein offers the advantage of efficient expression and correctly modified gene products (see especially page 5, lines 52-54).

Claims 1, 2, 5, 6-12, 14, 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodemer *et al.* (*supra*) as evidenced by Kaplan, C. (*supra*) and Buller *et al.* (*supra*) and further in view of any one of JP 55026477 (hereinafter '477); Sawamura *et al.* (U.S. Patent No. 5,962,260); Cheng *et al.* EP 0 585 960; Boehmert *et al.* (DE 3411472); Rasmussen *et al.* (U.S. Patent No. 5,236,838); Kataoka *et al.* (JP 020655779); or Cheng *et al.* (U.S. Patent No. 5,981,714; hereinafter Cheng *et al.* '714).

The teachings of Bodemer *et al.*, Kaplan and Buller *et al.* are applied to claims 1, 2, 5, 6-12, 14, 15 and 25 as set forth above. Bodemer *et al.* teaches that the composition disclosed therein has utility for the expression of recombinant proteins (see especially the second paragraph on page 2), which can be used to vaccinate animals (see especially paragraphs 4-6 on page 7). Bodemer *et al.* does not teach the composition comprising an exogenous nucleotide

sequence selected from the group consisting of the CFTR, LDLR, beta-galactosidase, beta glucocerebrosidase, insulin, parathyroid hormone and alpha-1-antitrypsin gene according to claim 14.

Japanese patent '477 teaches a method of detecting human PTH using antibody against PTH (see especially the attached translation of the abstract); Sawamura *et al.* teaches recombinant expression of LDLR (see especially bridging columns 6-7) and raising antibodies against recombinant protein (see especially Example 5, columns 13-14-); Cheng *et al.* teaches a method of raising an antibody against alpha-1-antitrypsin and utility of the antibody (see especially pages 2-3); Boehmert *et al.* teaches a method of raising an antibody against insulin and utility of the antibody (see especially the attached translation of the abstract); Rasmussen *et al.* teaches a method of producing enzymatically active recombinant glucocerebrosidase (see especially column 3, paragraph 3); Kataoka *et al.* teaches a method of raising an antibody against beta-galactosidase and utility of the antibody (see especially the attached translation of the abstract); and Cheng *et al.* '714 teaches a method of producing an antibody against CFTR and utility for the antibody (see especially column 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bodemer *et al.*, Kaplan and Buller *et al.* with the teachings of any one of Sawamura *et al.*, Cheng *et al.*, Boehmert *et al.*, Rasmussen *et al.*, Kataoka *et al.*, or Cheng *et al.* '714 to produce the composition of the instant claims 12 and 13. Motivation to combine these teachings comes from the teachings of Bodemer *et al.* who teaches that the pox-virus system disclosed therein offers the advantage of efficient expression and correctly modified gene products (see especially page 5, lines 52-54).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel M Sullivan whose telephone number is 703-305-4448. The examiner can normally be reached on Monday through Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, Ph.D. can be reached on 703-305-1998. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-9105 for regular communications and 703-746-9105 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

dms
May 14, 2003

JAMES KETTER
PRIMARY EXAMINER

JAMES KETTER
PRIMARY EXAMINER